

Vitamin E can modify the risk of pneumonia in some older men depending on their lifestyle

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Many people have been advised to take vitamin supplements to boost their immune systems. However, a recent study published in the *British Journal of Nutrition* found that taking vitamin E supplements led to an increased risk of pneumonia for more than one in four older men (28%) who smoked and did not exercise. However, the opposite effect was true for older men who exercised and did not smoke - in that vitamin E actually decreased their risk of contracting pneumonia.

The findings of this study - which focused on men aged 50 to 69 years old at the baseline of the trial - are particularly striking because analyses in nutritional epidemiology usually assume a uniform effect of a nutrient. However, the author of the study - Dr. Harri Hemilä of the University of Helsinki, Finland - found that the effect of vitamin E on health outcomes may depend on various characteristics of people and their lifestyles. Therefore, a single universal estimate of the vitamin E effect might be substantially misleading for some population groups.

The author studied the effect of vitamin E on the risk of [pneumonia](#) in a large randomised trial (Alpha-Tocopherol Beta-Carotene Cancer Prevention Study - ATBC) conducted in Finland between 1985 and 1993. There were 898 cases of pneumonia among 29,133 participants of the study.

Drawing on the I2 statistic for the first time for this type of analysis, Dr. Hemilä concluded that nearly all variation in the vitamin E effect on pneumonia risk over five subgroups was explained by true differences in the vitamin E effect rather than by chance variation.

Vitamin E increased pneumonia risk by 68%

among men who had the highest exposure to smoking and who did not exercise (22% of the ATBC participants), while vitamin E actually decreased pneumonia risk by 69% among participants who had the least exposure to smoking and who exercised during their leisure time (7.6% of the ATBC participants). The author claims that these findings refute there being a uniform effect of vitamin E supplementation on the risk of pneumonia.

The high level of true heterogeneity in the effect of vitamin E on pneumonia has important implications. First, it provides a strong argument against the opinion that subgroup analyses of randomised trials should be strongly discouraged because they can lead to false positive findings due to the multiple comparison problem. Second, the average effects of vitamin E that are calculated in meta-analyses may not be valid for many population groups. Third, in cohort studies, confounders are adjusted to allow the calculation of a single estimate of effect over the study population. However, when several variables modify the effect of vitamin E, it is evident that the effects of vitamin E should be investigated separately in subpopulations with those characteristics.

Given the current limited understanding about who might benefit, Dr. Hemilä recommends that vitamin E should not be suggested for the general population for improving the [immune system](#). The author concludes that there is a need for further research on vitamin E for non-smoking elderly men who exercise in their leisure time.

More information: Harri Hemilä, Vitamin E and the risk of pneumonia: using the I2 statistic to quantify heterogeneity within a controlled trial, *British Journal of Nutrition* (2016). [DOI: 10.1017/S0007114516003408](https://doi.org/10.1017/S0007114516003408)

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